

8. EXPLAINING THE DIFFERENCES: THE ROLES OF FIRM SIZE AND PRE-INJURY EARNINGS

Two significant differences between the self-insured and the insured are the number of employees and the level of pre-injury earnings, as discussed above. In this section, we will explore differences in wage loss and replacement rate by firm size and pre-injury earnings *within* the self-insured and the insured. The purpose of this analysis is two-fold. First, we wish to investigate whether subpopulations by firm size or pre-injury earnings reveal adequacy issues. The analysis reveals low wage replacement for injured workers with high earnings at both the self-insured and the insured. Second, we wish to investigate whether differences in firm size or earnings results in patterns similar to the differences between the insured and the self-insured. We find in particular that the patterns in pre-injury earnings provide insight into the explanation for lower replacement rates at the self-insured. The section concludes with a discussion of analyses (reported in more detail in the appendix) that compare similarly sized and equal-paying firms that differ only in insurance status.

Table 12 shows earnings losses and replacement rates for 1993 injuries at self-insured employers and insured employers by quartile of firm size (number of employees).¹ The average firm size within each quartile is reported in the first column. The table illustrates again the size difference between self-insured and insured firms. At insured firms, the average firm size for the largest quartile is smaller than the average firm size for all but the smallest quartile at the self-insured. The twenty-fifth percentile of firm size for the self-insured is 4,705 employees (with an average firm size for firms below that percentile of 1,715), while the seventy-fifth percentile for the insured is only 393 employees (with an average firm size above that percentile of 3,932).

If the lower proportional earnings loss at self-insured firms is in part attributable to firm size, we would expect to find that within both the self-insured and the insured, proportional losses would be smaller the larger the employer. Table 12 confirms this prediction. Except when moving from the lowest to the second lowest quartile in the self-insured, higher firm size quartile consistently leads to lower proportional earnings loss. However, the lowest quartile of the self-insured, which includes firms that are on average smaller than the largest quartile of the insured, still has lower proportional losses, suggesting that firm size does not explain all of the differences between the self-insured and the insured.

¹ The lowest quartile represents workers below the twenty-fifth percentile of firm size. The second lowest quartile represents workers with firm size between the 25th and 50th percentiles. The upper two quartiles are defined similarly.

Table 12**Earnings Losses and Replacement by Firm Size Quartile, Insured Employers, 1993 injuries**

Average Firm Size	5-Year Earnings Losses (\$)	5-Year Potential Uninjured Earnings (\$)	Indemnity Paid by Year 5 (\$)	5-Year Prop. Loss	Replacement Rates		
					5-Year Pre-Tax	5-Year After-Tax	10-Year After-Tax
Self-Insured							
1715	36,024	136,703	19,139	0.264	0.531	0.695	0.497
11,019	34,056	123,410	17,812	0.276	0.523	0.680	0.468
25,469	49,822	218,521	21,476	0.228	0.431	0.576	0.458
52,690	33,749	187,978	16,566	0.180	0.491	0.666	0.414
Insured							
21	34,050	96,712	17,623	0.352	0.518	0.666	0.486
73	33,591	103,126	16,779	0.326	0.500	0.645	0.475
219	31,669	98,331	16,978	0.322	0.536	0.695	0.547
3,932	33,555	115,290	19,038	0.291	0.567	0.741	0.573

Figure 17 illustrates the impact of firm size on the patterns in earnings losses following injury using a figure that extends Figure 10. The figure shows the ratio of the earnings of injured workers to comparison workers before and after injury at insured and self-insured employers. Within each insurance class, the earnings pattern is shown for the smallest and largest quartile. Smaller firms reveal a more significant decline in earnings of injured workers relative to controls.

Table 12 does not reveal a consistent relationship between firm size and replacement rate. This inconsistency may result because larger firms typically pay more (see, e.g. Troske, 1999), and the effect of employer size on replacement rate combines the positive effect of employer size on return to work with a negative effect of higher earnings on replacement rate. In Table 12, the relationship between firm size and earnings can be observed by examining the pattern in potential uninjured earnings (the earnings of the comparison workers over the five years after injury). Potential uninjured earnings do not increase consistently with employer size, but in the self-insured, the two largest quartiles have higher earnings than the two smallest quartiles, and in the insured, the largest quartile has the highest potential uninjured earnings and the smallest quartile has the lowest.

Table 13 conducts an analysis with pre-injury earnings that is similar to the Table 12 analysis with firm size. The top panel of Table 13 shows earnings losses and replacement rates for 1993 injuries at self-insured employers by pre-injury earnings quartile.² Quartiles are defined by the earnings distribution at self-insured firms, and not in the full population of injured workers

(including insured firms). The lowest earnings quartile (“low earners”)—claimants with quarterly earnings in the quarter prior to injury below \$5663—experienced earnings losses over the five years after injury of \$31,170. This was a proportional loss of 38.4 percent.

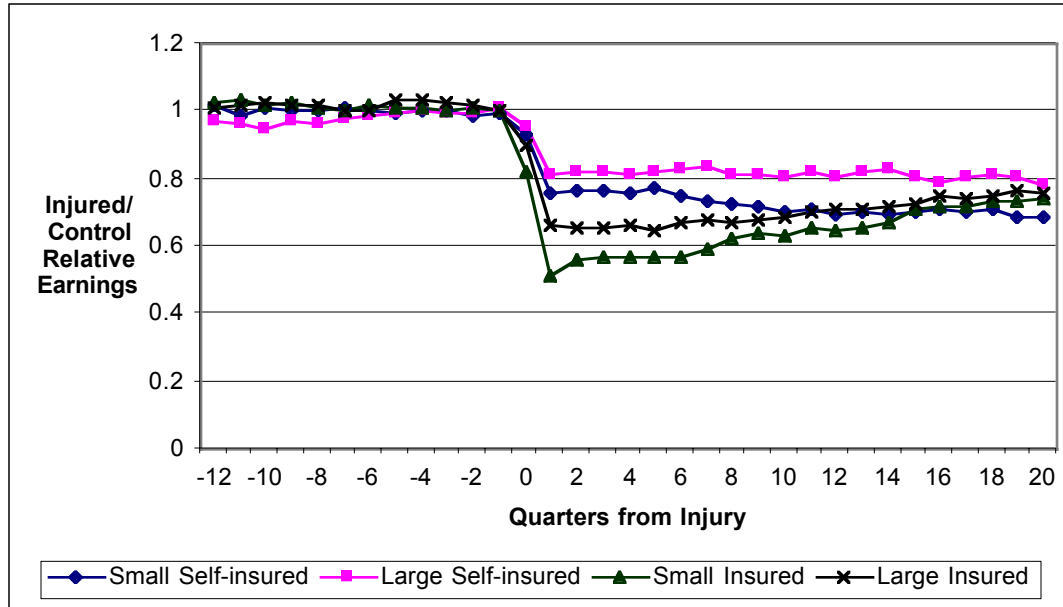


Figure 17—Relative Earnings Before and After Injury by Firm Size, Self-insured and Insured, 1993

The highest earnings quartile (“high earners”), including pre-injury quarterly earnings above \$12,119, experienced earnings losses of \$50,841, representing a proportional loss, 18.4 percent, which is considerably lower than the proportional loss for the low earners. Nonetheless, since the two groups each received approximately \$18,000 total indemnity over the five years after injury, and the absolute losses were higher for the high earners, the replacement rate for the high earners was only 36.7 percent, which is lower than the 58.1 percent pre-tax replacement rate of the low earners.

If the differences between the self-insured and insured were in part attributable to pre-injury earnings, comparing the low earners to the high earners within the self-insured should reveal patterns that are similar to comparing across insurance classes. The table shows that comparing across pre-injury earnings groups reveals patterns of earnings loss and replacement that mirror the comparison between self-insured and insured firms. For workers with higher

² The lowest quartile represents workers with pre-injury quarterly earnings below the twenty-fifth percentile. The second lowest quartile represents workers with pre-injury quarterly earnings between the 25th and 50th percentile. The upper two quartiles are defined similarly.

earnings, losses in absolute terms are higher but proportional losses are lower. Benefits do not vary by earnings quartile. Replacement rates decline with increases in pre-injury earnings.

Table 13

Earnings Losses and Replacement by Pre-Injury Earnings Quartile, Self-Insured Employers, 1993 injuries

Pre-Injury Earnings Percentile (within group)	5-Year Earnings Losses (\$)	5-Year Potential Uninjured Earnings (\$)	Indemnity Paid by Year 5 (\$)	5-Year Prop. Loss	Replacement Rates		
					5-Year Pre-Tax	5-Year After-Tax	10-Year After-Tax
Self-Insured							
0-25	31,170	81,136	18,121	0.384	0.581	0.740	0.494
25-50	36,715	130,828	20,348	0.281	0.554	0.725	0.528
50-75	39,751	188,722	19,312	0.211	0.486	0.650	0.466
75-100	50,481	274,841	18,522	0.184	0.367	0.499	0.385
Self-Insured, Low-Rated Claims (Total Indemnity Below Median)							
0-25	17,872	78,623	5,477	0.227	0.306	0.391	0.197
25-50	15,113	131,340	5,827	0.115	0.386	0.515	0.289
50-75	13,902	186,958	6,282	0.074	0.452	0.615	0.317
75-100	14,247	277,455	5,977	0.051	0.419	0.595	0.474
Self-Insured, High-Rated Claims (Total Indemnity Above Median)							
0-25	44,713	83,696	30,998	0.534	0.693	0.882	0.627
25-50	56,326	130,364	33,531	0.432	0.595	0.775	0.585
50-75	64,720	190,426	31,898	0.340	0.493	0.657	0.499
75-100	91,061	271,914	32,573	0.335	0.358	0.483	0.375

The bottom two panels divide the sample of claims into low-indemnity (below the median of \$13595) and high-indemnity (above \$13595) claims, and then within each indemnity category, losses and replacement are reported by earnings quartile (defined using the same percentiles as the overall estimates in the top panel). The general pattern in proportional earnings losses continues to hold: The higher the earnings, the lower the proportional losses. The patterns in replacement rates are much more difficult to summarize. Among high indemnity claims but not among low indemnity claims, replacement rates fall with income. However, the two lowest replacement rates at five years are for the lowest earnings quartile, low-indemnity claims (31 percent before tax replacement) and the highest earnings quartile, high-indemnity claims (36 percent before tax).

Table 14 reports the same information as Table 13 for claims at insured firms in 1993. In general, no particular pattern in proportional earnings losses emerges across earnings quartile at the insured. However, the pattern in replacement rates is striking: Higher earnings workers have lower replacement rates. In the top panel, the lowest earnings quartile, pre-injury quarterly earnings below \$3284, has \$16,278 in losses at five years, and \$14,703 in benefits. The pre-tax

replacement rate at five years is over 90 percent. In contrast, the highest earnings quartile, quarterly earnings above \$7950, has a replacement rate of only 37.4 percent.

Table 14

**Earnings Losses and Replacement by Pre-Injury Earnings
Quartile, Insured Employers, 1993 injuries**

Pre-Injury Earnings Percentile (within group)	5-Year Earnings Losses (\$)	5-Year Potential Uninjured Earnings (\$)	Indemnity Paid by Year 5 (\$)	5-Year Prop. Loss	Replacement Rates		
					5-Year Pre-Tax	5-Year After- Tax	10-Year After- Tax
Insured							
0-25	16,278	49,473	14,703	0.329	0.903	1.120	0.837
25-50	24,818	71,098	16,801	0.349	0.677	0.801	0.609
50-75	38,382	109,466	19,019	0.351	0.496	0.595	0.482
75-100	53,146	183,745	19,889	0.289	0.374	0.456	0.410
Insured, Low-Rated Claims (Total Indemnity Below Median)							
0-25	8,439	46,424	4,898	0.182	0.580	0.715	0.496
25-50	13,780	70,091	4,850	0.197	0.352	0.445	0.309
50-75	22,204	112,113	5,069	0.198	0.228	0.298	0.180
75-100	27,023	187,947	5,122	0.144	0.190	0.253	0.147
Insured, High-Rated Claims (Total Indemnity Above Median)							
0-25	26,567	53,475	27,570	0.497	1.038	1.290	0.975
25-50	36,638	72,177	29,599	0.508	0.808	1.014	0.715
50-75	52,342	107,182	31,056	0.488	0.593	0.766	0.599
75-100	74,684	180,281	32,064	0.414	0.429	0.570	0.493

The lower two panels divide indemnity above and below the median of \$12,038. Low-indemnity claims show very low replacement rates. High-indemnity, low-earnings claims have the highest replacement rate observed in any category. It is almost full wage replacement even at ten years (after tax). The pattern of declining replacement rates with earnings is evident in both the above-median and below-median panels. Thus, in the high indemnity category, while low earnings claims have a high replacement rate, the highest earnings category has a replacement rate comparable to the low-indemnity categories.

When comparing replacement rates across low- and high-indemnity claims, differences in the level of proportional losses are ignored. In both Table 13 and Table 14, it is clear that proportional losses are considerably higher for the high-indemnity claims. As noted above, an alternative measure of adequacy that is not neutral to the level of losses is uncompensated earnings loss (or losses remaining after benefits are paid). Figure 18 reports uncompensated earnings losses for insured and self-insured claims, above and below the median indemnity, and by pre-injury earnings quartile. The data are taken from the bottom two panels of Table 13 and

Table 14, with uncompensated losses estimated by subtracting indemnity from 5-year earnings losses.

In three of the four sub-panels of Figure 18, uncompensated losses increase with quartile of earnings. The exception for this pattern is low-indemnity claims at the self-insured, which shows no particular relationship between uncompensated losses and pre-injury earnings quartile.

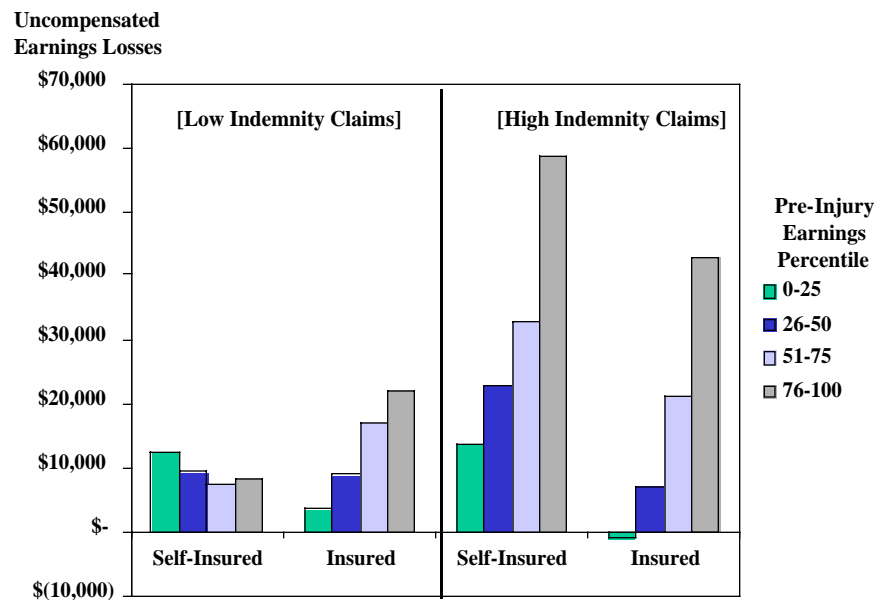


Figure 18—Uncompensated Wage Losses by Quartile of Pre-Injury Earnings, High-Rated and Low-Rated Claims, 1993 Injuries at Five Years, Pre-tax

Examination of Table 13 reveals that the highest two earnings quartiles among the low indemnity claims at the self-insured have extremely low proportional earnings losses: 7.4 percent for the third quartile, and 5% for the fourth quartile. Since high-earning, less-disabled claimants are likely to be the quickest to return to work and the easiest to accommodate, and self-insured employers are likely to be most able to accommodate, uncompensated losses are relatively low for even the high earnings claims in this group. The outcomes for this group best exemplify the successes of the self-insured. Proportional losses are low. Uncompensated losses, as a fraction of potential uninjured earnings, are very low (for the highest earnings group among low indemnity claims at the self-insured, only 3 percent of potential uninjured earnings are ultimately lost).

The figure also shows that the high-indemnity claims in lowest quartile of pre-injury earnings at insured firms are compensated over 100 percent. Despite losing approximately 50 percent of earnings, the indemnity paid over the five years after injury exceeds the losses experienced.

The uncompensated losses of the high pre-injury earnings, high-indemnity claims at both the self-insured and the insured are striking. At the self-insured, the claims in top quartile of pre-injury earnings have uncompensated losses of \$58,488 over the five years after injury. Claims in the top quartile of pre-injury earnings at the insured have uncompensated losses of \$42,619. These two groups reveal the combined weaknesses of the workers' compensation system. As more disabled claimants, they are harder to accommodate, even at the self-insured. In addition, as high-earnings claimants, they are subject to caps, and receive benefits that are no greater than for other earnings categories, despite considerably higher losses in absolute terms. Whether the outcome for this group is measured by replacement rate or by uncompensated losses, the results seem least adequate.

The results of this section suggest that differences between the self-insured and the insured in pre-injury earnings and in firm size may account for many of the differences observed in proportional losses. However, in the tables and figures, we control for one characteristic, such as firm size in Table 12, while the other characteristics of self-insured firms and insured firms continue to differ. Therefore, the results are only suggestive. In Appendix A, we report the results of a multiple regression analysis that simultaneously controls for multiple factors that may determine proportional losses. The results of the regression analysis for differences between insured and self-insured firms in proportional wage loss are summarized in Figure 19.

The figure shows the results for 1993-95 pooled, and also the results for 1994. The full regression results are reported for these years in Appendix A, Table A8, and for 1993 and 1995 in Appendix A, Table A9. Without controlling for any of the differences between self-insured and insured claims, the full predicted values for proportional wage losses from the regression for 1993-95 claims are 0.21 for self-insured claims, and 0.343 for insured claims. Therefore, the difference of 0.133 is reported in the figure on the far left of the left panel. The middle bar of the left panel reports the difference between claims at insured firms and self-insured firms after controlling for the difference in industry composition between the two samples. This amount falls to .084. In other words, comparing an insured firm and a self-insured firm in the same industry (though without controlling for other differences, such as pre-injury earnings and the number of employees), then proportional wage losses in the insured sector would be 4.9 percentage points lower than ignoring differences in industry.³ The right bar on the left panel shows the difference after controlling simultaneously for industry, pre-injury earnings, and the number of employees. In other words, when comparing two firms that are in the same industry,

³ Public utilities (communications, water, and power) are a large part of the difference. This industry is predominantly self-insured and has very low proportional wage losses.

have the same average earnings, and the same number of employees, insured firms would still have a higher proportional wage loss by .051.

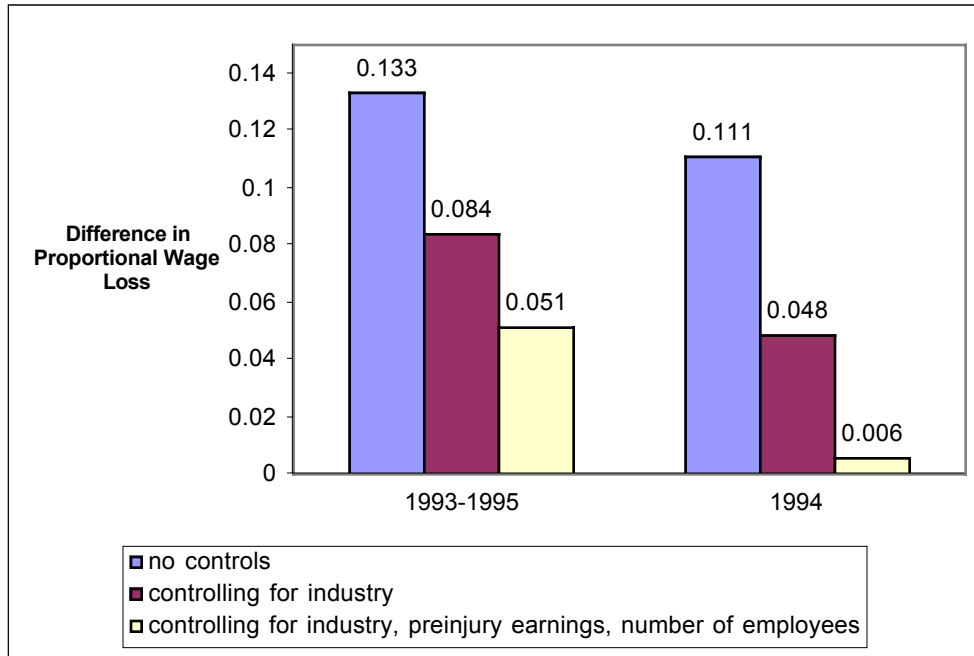


Figure 19—Difference Between Insured and Self-Insured Proportional Wage Loss Before and After Controlling for Other Characteristics of Claim

The figure also shows the difference for 1994 because the results for that sample suggest that after controlling for industry, pre-injury earnings, and the number of employees, there is no difference in proportional wage losses between insured and self-insured firms. Therefore, strong conclusions about the value of self-insurance *per se* are unwarranted. Nonetheless, the results provide weak evidence that if similar claims at insured firms occurred at self-insured firms instead (or if, for instance, insured firms faced a greater degree of experience rating), outcomes for the injured worker might be better.